

LOUISIANA CONSERVATIONIST



Volume 1

SEPTEMBER, 1943

Number 10

March 29, 1943

Dear Fellow Sportsman:

Even if you don't expect to fish or hunt this year - **BUY A LICENSE!** And urge your friends and fellow club members to buy one too. No use kidding ourselves; war conditions are going to keep a lot of us "grounded" in 1943. And plenty of good sportsmen are in foreign service with our armed forces. But conservation work must go on if our sport is to be preserved for the future - and license fees are what pay the freight. So start the **BUY A LICENSE** Movement in your town by getting your own fishing license today.

Reuben J. Brown
Editor

OUTDOOR LIFE

353 Fourth Ave., New York, N.Y.

1943 Hunting Licenses Are Now on Sale

But Hunters Continue To Chorus "Praise the Lord and Pass Ammunition"

Louisiana's 1943-44 hunting licenses are now on sale. They may be obtained from any sheriff's office in the State and from many hardware and sporting goods stores.

Despite the uncertainty as to the amount of ammunition that may be available to civilians this fall and winter for recreational hunting, officials of the Conservation Department are expecting license sales to compare favorably with recent years. In 1941, a total of over 146,000 hunting licenses were sold and last year close to that same number were sold.

The hunting season in Louisiana officially got under way September 15th when it became legal to shoot rails and gallinules. However, about the only ones who got an early start on shooting were those who had ammunition left over, as the War Production Board has made no official announcement about how civilians are to go about getting ammunition for recreational hunting. Farmers and others, however, have been able to get some ammunition to kill pests and for "crop control" purposes.

The United States Fish and Wildlife Service has recommended that a total of 2,000,000 rounds of shotgun ammunition and 25,000 rounds of rifle ammunition be made available for Louisiana hunters, and that these be sold through regular retail channels.

The season on rabbits and squirrels gets under way October 1st and on ducks and geese the season opens November 2nd. Something official in the way of ammunition is expected to be announced any day now.

Governor Declares Emergency As Forest Fires Devastate Large Areas

The alarming rate of destruction to state protected forest land by fires, causing "abandonment of the acreage burned by our wood using industries", has caused Governor Sam Jones to issue a proclamation declaring a state of emergency in the Northern part of Louisiana due East and due West on a line passing through Alexandria.

The proclamation, issued following a special report to the governor by State Forester Massey H. Anderson, after a conference with Conservation Commissioner Joseph L. McHugh, discloses that industries vital to the war effort are being threatened with closing down and that cattle, game and wildlife, which are important factors in the nourishment of a war-stricken nation, might not be able to survive unless drastic measures are taken for the preservation of the state's wooded areas.

Mr. Anderson reported that 151,000 acres of land in state protected areas have been devastated since January 1, 1943, with a monetary loss of \$300,000 and a loss to the war effort and the

future resources of the state that cannot accurately be computed in dollars and cents.

"Obviously, extreme measures are in order," Mr. Anderson observed in his letter to the governor, "since in the last two months we have had 20 inches less rainfall than in normal times and the hazard to our forest lands increased proportionately. If we included the losses to the unprotected areas of the state, they would be ten times greater and that is a conservative estimate.

Governor Jones appeals to all citizens to cooperate fully in the prevention and suppression of forest fires. His proclamation is as follows:

Proclamation

"Whereas, we are experiencing an extended period of draught in the Northern half of our State; and,

"Whereas, our forest using industries are almost totally employed in the manufacture of war goods; and,

(Continued to Page 4, Column 3)

Department To Have Exhibits At Two Fairs

Fairs at Donaldsonville And Shreveport to Get Conservation Exhibits

Arrangements have been completed for an interesting and educational exhibit depicting Louisiana's natural and fishery resources, which are to be placed at two fairs in the State this fall and winter, it has been announced by Conservation Commissioner Joseph L. McHugh.

The Conservation Department will be represented at the South Louisiana State Food for Victory Fair to be held at Donaldsonville on October 1, 2 and 3, and also at the Louisiana State Fair, Junior Live Stock Show, at Shreveport from October 23rd through November 1st.

Plans for the exhibit are being made by the Division of Education and Publicity. The exhibit will depict the various natural resources of the state and will also have a section showing scenes from some new state parks.

SAM H. JONES
Governor of Louisiana



JOSEPH L. McHUGH
Conservation Commissioner

LOUISIANA CONSERVATIONIST

Published Monthly in the interest of conservation by the
Louisiana Department of Conservation
126 Civil Courts Building, New Orleans, La.

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With our 1943-44 hunting season rapidly approaching, nothing official has as yet been announced by the War Production Board as to the amount of ammunition to be available to civilians for recreational hunting. In the meantime, we have been informed that the United States Fish and Wildlife Service has made recommendations for allotment and distribution of ammunition for civilian use, on the basis of hunting licenses issued in each state, and also on records of game population and predatory animal depredations. On this basis, Louisiana has been recommended for 2,000,000 rounds of shotgun ammunition and 25,000 rounds of rifle ammunition.

It has also been recommended, we understand, that individuals be limited to the purchase of one box of 25 shotgun shells and one box of 20 center-fire rifle ammunition, and that each purchaser will be required to present a 1943 hunting license on which the dealer will make notation showing date, amount and type of ammunition purchased. Each purchaser also will be required to certify to the dealer that he does not have more than two boxes of shotgun shells in his possession.

It must be remembered that these are merely recommendations which have been made by the United States Fish and Wildlife Service and final action must be taken by the War Production Board. One thing is certain, the amount of ammunition available to hunters for the coming season is going to be such that every hunter will have to use it carefully.

Through the efforts of Governor Jones, the Conservation Department and other state agencies, Louisiana has been successful in blocking the proposed construction of a gas pipe line from South Louisiana fields to Kentucky. The Governor appealed to Louisiana gas producers to decline to furnish gas from this state, but to conserve Louisiana gas to develop industries within our own borders.

As you may recall, the Legislature in 1942, adopted a resolution deploring dwindling state natural gas stores and declared it to be the state's public policy to oppose future lines for export of gas. Your state officials have been successful in upholding the terms of this resolution.

The fight to obtain an increase in the price of crude oil and thereby encourage the drilling of new wildcat wells is continuing despite adverse action from Washington. The movement will gain new impetus at the next meeting of the Interstate Oil Compact Commission to be held in Sante Fe, New Mexico, on September 24th, and I am planning to attend it as a representative from this state.

ACTING SECRETARY



Daniel O. Payne assumed his new duties as Acting Secretary of the Conservation Department on September 4th, succeeding Marvin C. Potter, who entered the Army of the United States on that day.

Mr. Payne has served as court reporter for the Department's Division of Minerals since October, 1940, with the exception of six months' service as court reporter for the Judge Advocate General's Office, New Orleans Port of Embarkation.

A former newspaper man, Mr. Payne, a native of New Orleans, attended public schools in Austin, Texas, the Texas Military College, West Texas State Teachers' College, the University of Texas and the University of Dallas, where he studied journalism, Spanish and business administration.

Printed folders are now available showing the new hunting regulations for the 1943-44 season and these may be obtained upon request from the Department of Conservation, and also from any sheriff's office.

DIRECTORY OF DIVISION HEADS AND OFFICIALS OF CONSERVATION DEPARTMENT

Jos. L. McHugh, Commissioner
Chas. E. Morefield
Acting Executive Assistant
Hale Boggs, Attorney
Daniel O. Payne,
Acting Secretary
H. M. Grode, Chief Accountant
J. N. Gowanloch,
Chief Biologist
Isaac D. Chapman,
Education and Publicity
J. G. Appel, Enforcement
Armand P. Daspit,
Fur and Refuge
Massey H. Anderson, Forestry
Dr. J. Huner,
Geological Survey
H. W. Bell, Minerals
J. N. McConnell,
Oysters and Waterbottoms
Wm. F. Chisholm,
Research and Statistics
James Brown,
Wildlife and Fisheries

TWO MINERAL HEARINGS SET FOR SEPTEMBER 20th

Two mineral hearings have been set for Monday, September 20th to be held in the Supreme Court Room at the State Capitol in Baton Rouge. One hearing will pertain to the application of the Gulf Refining Company for an integration order in the Pine Prairie Field in Evangeline Parish, and the second hearing will be upon the application of the Texas Company for amendment to Order 34-B providing rules governing dual completion of wells in the Erath Field.

The real sportsman will adhere to the laws, for never let it be said when the service men come back, that all this creed of preserving wildlife for posterity has been but idle phraseology.

Activities of the Division of Minerals

(Editor's Note—In order to acquaint the general public with the activities and functions of the various Divisions within the Department of Conservation, we will present in future issues of "The Conservationist", articles written by each Division head describing the work of his particular Division.

This is the first of such a series of articles. Others will appear in future issues.)

By H. W. BELL, Director

The work of this division of the Department of Conservation has to do almost entirely with the oil and gas resources of Louisiana. We are charged with enforcing the basic laws and our own orders and regulations which pertain to these substances. These rules of action are necessary for many reasons, such as (1) to secure an equitable and reasonable distribution of the total state allowable in the many fields and to the wells thereof; (2) to collect and tabulate the production data currently and cumulatively for the permanent records of the State. These data tie in with tax returns, royalty payments, over-production, etc.; (3) to study the production and other data, such as gas-oil ratios, bottom-hole and other pressures, water intrusion, reservoir characteristics (porosity, permeability, saturation, thickness) and the logs of wells drilled, for the determination of production rates that can be applied without underground waste or harm to the reservoir or decrease of ultimate production due to premature intrusion of water or of gas due to the unwarranted bypassing of gas from solution, leaving "dead" oil behind in the reservoir; (4) to study all available data and past experience to determine safe and reasonable practices for drilling, casing, protecting oil, gas and fresh water deposits for the future, and completing wells—to uniformly enforce such regulations; (5) to make and witness various tests on producing wells, to change or cancel allowables at any time new conditions warrant; (6) to consider and recommend concerning operator's applications for drilling, work-overs or abandonments and to see that safe protective measures are carried out; (7) to attend hearings, assist in developing the pertinent evidence and advise the Commissioner of Conservation as to recommendations.

Many geological problems are presented in connection with such factors as productive area, location of faults and fault blocks or other structural features. The Louisiana Geological Survey, under the direction of Dr. J. Huner, Jr., supplies data and checks the data of others, as basis for many important decisions.

The Division of Minerals operates under the supervision of Commissioner Jos. L. McHugh whose headquarters are in the main department office at New Orleans. The office of the Division of Minerals is located at Baton Rouge in the State Capitol Building. The key men at Baton Rouge are H. W. Bell, Director, P. S. Ervin, Chief Engineer, A. A. Massicot, Office Manager, and W. H. Elliott, Statistician. The force at Baton Rouge comprises twenty employees.

The legal work of the Department of Conservation is handled by Mr. Hale Boggs at New Orleans.

The State is divided into six districts for the purpose of carrying on the field work. The following are the district managers in charge and the sizes of their forces:

Houma.....	D. J. Robichaux.....	7
Lafayette.....	D. D. Gooch.....	7
Lake Charles.....	Frank J. Fava, Jr.	8
Monroe.....	D. S. Cook.....	8
New Orleans.....	P. A. Huth.....	7
Shreveport.....	C. B. Smitherman ..	11
Total Field Men.....		48
Baton Rouge Office.....		20

Total force August, 1943..... 68

A permit and a \$50.00 fee is required for the drilling of a well for oil, gas or other mineral in Louisiana. The operator is required to submit his application to drill, on a regular form, which gives the location, contemplated depth, acreage assigned (amount and outline), and the contractor. These application cards are usually accompanied by maps or plats and are sent to the appropriate District Office. If the Manager finds the application in order, it is sent to Baton Rouge for final approval and issuance of the permit. The greater the depth to be drilled the greater amount of surface casing is required.

After wells are finished there are various types of changes or remedial operations that are found necessary to accomplish for best results toward ultimate re-



H. W. BELL
Director Minerals Division

covery and proper conservation. These operations are commonly called "work-overs". They include such modifications as deepening, plugging back, perforating casing, "squeezeing" off perforations or open reservoir with cement under extra pressure, setting additional casing, converting to salt water disposal wells and abandonment. These operations are for such purposes as increasing production, decreasing the amount of salt water or gas production, changing production from one reservoir to another and preventing the travel of oil, gas or salt water from one formation to another.

Applications for these operations are made on regular form and sent to the appropriate district manager. He passes on the proposal and issues a permit or states what is necessary to be done to meet the requirements. When such proposals are unusual the matter is referred to the Baton Rouge office and may be made the subject of a conference or possibly a formal hearing.

Numerous formal hearings have been held in Louisiana since Act 225 was passed by the Legislature in 1936. The matters considered have included drilling and producing rules for certain pools (separate reservoirs); the spacing of wells for adequate drainage; the monthly distribution of the State allowable of oil; the unitization of pools or fields for efficient development and production; the unitization of small tracts into drilling and producing units; alteration of established units.

These formal hearings are conducted under rules or procedure which approximate those of courts of law. Sworn testimony is made into a transcript and considerable written and pictorial data are usually required. These hearings are presided over by the Commissioner of Conservation. Usually there is also present the attorney, director, state geologist, chief petroleum engineer and district manager.

Early in 1942 the office of the Office of the Petroleum Coordinator (now Petroleum Administrator for War) requested that oils, having special qualities for the making of "high octane" aviation gasoline, be given extra allowables when such oil was actually used for that purpose and when such increased production could be made without harm to the wells and reservoirs. Accordingly, we grant such increases after the applicant has presented proper analysis and other data. Type I oil can make a reasonable amount of 100 Octane gasoline after the addition of alkylates and tetra-ethyl-lead. Type II is capable of attaining about 91 Octane number by the same aids and Type III is not suitable for aviation gasoline.

As is the case with all lines of endeavor, there is much more to the drilling and producing phases of the "oil business" than the uninitiated can realize. There are not only the numerous chemical and physical problems, but these are complicated by many of the operations and processes being underground and out of sight. America has led the way in employing invention and science toward the solution of many perplexing problems. This statement means to exclude the very apparent "scientific" nature of petroleum refining operations.

Thus there has been built up the new profession of Petroleum Engineering. The Division of Minerals has continual need for the services of such men and is now short of them due to the war emergency. Our best inspectors are usually men with plenty of actual experience in drilling and production operations. Such men have acquired the ability to interpret, from the signs noticeable at the surface, what is happening or has happened underground. Inasmuch as Louisiana has the deepest (13,400 ft.) producing well in the world and about the greatest average depth for any state or country, the import of situation becomes understandable.

HUNTERS ADVISED HOW THEY CAN GET BEST RESULTS WITH FEW SHELLS

By IRA N. GABRIELSON, Director
U. S. Fish and Wildlife Service

Although we cannot yet announce the amount of ammunition that may be released for hunters this fall, we are certain that it will not be enough to take a normal harvest of wildlife. Because this limited supply will not go far, unless judiciously used, I am appealing to sports writers to put on a campaign emphasizing the following points:

1. Hunters should shoot conservatively and make every shot count. Long range shooting, which wastes ammunition and results too often in crippling, should be "out" for the duration.

2. Hunters who can do so should hunt near home and thus save the overloading of public transportation facilities. The idea that "the far fields are always greener" is not entirely true. Many sportsmen live adjacent to excellent hunting areas which they have overlooked in the past in favor of a cross-country trek. This year the slogan should be, "Hunt near home and save transportation."

Recreation Is Vital

3. We all know that some recreation is vital in wartime, particularly for war workers who need short periods of time in the open to recharge their physical and mental energies. The recreational value of hunting alone, therefore, is sufficient to justify such hunting as may be possible under war conditions, without considering the value of the food taken. Nevertheless, during the 1942-43 season, hunters took 255,404,000 pounds of usable meat for home consumption. This annual crop of wildlife, so needed to help out in the present meat shortage, cannot be harvested except by recreational hunting.

4. Hunters who live close to areas where wild game is too thick should concentrate their hunting efforts in such regions with the two-fold purpose in mind of helping to reduce an over-abundant wildlife population which may be doing damage to farm crops, and at the same time easing the hunting pressure in other areas so as to allow game stocks to build up.

Should Redistribute Shells

5. The great game of hoarding, which so many Americans participated in before food rationing went into effect, extended also to the hoarding of shotgun shells. Greedy individuals, fearing their



IRA N. GABRIELSON

cupboards would be bare this season, filled them with stocks entirely too large for personal use. Such actions, of course, were entirely unsportsmanlike. I hope that all outdoor writers will make an appeal to good sportsmanship and fair play, and start a campaign to get local sports groups to collect these large ammunition stocks and re-distribute them equitably. Every man who wants to go hunting this season should have his chance to do so. By spreading shells around evenly every man will have his chance.

6. As the final point in this national campaign, I am urging sportsmen to take mallards, widgeons, and pintail duck, where possible, in preference to the other species of duck which are still comparatively low in numbers and which cannot stand the heavy hunting pressure that the three mentioned species can. Concentrate on mallards, widgeons, and pintails—give the other species a chance to come back!

All of us who are interested in wildlife want to see sportsmen of America take a reasonable share of big and small game when the hunting seasons open next fall. To accomplish this we must start now to get over to the public the idea that some new rules must be observed for the forth-coming season.

If you learn of a humorous situation, or have pictures involving fish or game, jot down the main facts and send them in to "The Conservationist." We need a little something to break the monotony of all work and no play.

GOVERNOR'S PROCLAMATION

(Continued from Page 1)

"Whereas, at this time, forest fires are devastating thousands of acres of our natural resources, causing the abandonment of the acreage burned by our wood using industries, and also causing the effected acreage to become useless as range for cattle; and,

"Whereas, it is necessary for our forests to remain productive in order to continue its vital contributions to the war effort, and in order that our wood using industries might not be forced to close, and that cattle, game and wild life in general might continue to survive in forested areas,

"Now, Therefore, I, Sam H. Jones, Governor of the State of Louisiana, in consideration of the premises and by virtue of the authority granted by law do hereby declare and proclaim a state of emergency to exist in the Northern part of the State of Louisiana, more specifically designated by a line due East and due West, and passing through Alexandria. I do further declare and proclaim that during this extreme dry period it is the duty of every citizen to co-operate fully in the prevention and suppression of all forest fires.

"In Witness of the Above Proclamation, I have hereunto set my hand and caused to be affixed the Great Seal of the State of Louisiana, at the City of Baton Rouge, this 4th day of September, A. D., 1943.

"SAM H. JONES,
"Governor of Louisiana."

\$60,000 Lime Quarry Opens In Bienville

The \$60,000 Louisiana Limestone company's quarry in Bienville parish was formally opened Thursday, September 2nd, with approximately 75 men from North Louisiana present.

The plant, owned and operated by W. H. Johnson of Shreveport, is expected to mine more than two million tons. It has a capacity of 250 tons a day.

The company plans to secure special trucks with lime-spreading equipment which can be used to haul lime and spread it on the farm—if preferred to rail or ordinary truck delivery. The cost of the lime will be \$1.25 per ton at the plant.

Can Burnham, a farmer from Bienville parish, was master of

ceremonies and J. L. Dickson, Mayor of Hodge, welcomed the group. H. T. Long, manager of the quarry, explained present plans. Most of the delegation were members of the agriculture committee of the Ruston chamber of commerce, which has recently started on a five-year pasture improvement program. The expert the availability of lime from so nearby source to be one of the most important factors in the success of the new pasture program.

DAM AND BRIDGE TO BE BUILT AT BLACK BAYOU IN CADDO PARISH

A 10-ton bridge, 400 feet long, and over 18 feet wide will be constructed on highway 109 at Black Bayou in Caddo Parish, in the immediate future, according to a recent announcement by D. Y. Smith, director of the Department of Highways. Bids for the construction of the bridge and dam will be opened September 22nd.

Three state departments have co-operated with the Caddo parish police jury to jointly finance the project without federal aid. Total cost is estimated at approximately \$50,000.

A maximum of non-critical materials will be used and permission has been received from the War Production Board to go ahead with the project.

Last June, heads of the three departments interested in the project made an inspection of the project on the grounds. Accepting the invitation of the Caddo Parish police jury were Mr. Smith, Joseph L. McHugh, Conservation Commissioner, and De Witt L. Pyburn, director of the Department of Public Works.

FORESTRY GOVERNING BOARD HOLDS MEETING

The State Forestry Governing Board held a meeting in New Orleans at the Monteleone Hotel Tuesday, September 14th, to discuss a proposed forestry legislation program. The meeting was presided over by Conservation Commissioner Joseph L. McHugh, ex-officio chairman of the Board.

Members of the Forestry Board are Ventress Young, Bogalusa; Ralph W. Hayes, Baton Rouge; C. V. Holbrook, DeRidder; P. A. Bloomer, Fisher; W. T. Murray, Rochelle, and State Forester M. H. Anderson, ex-officio member.

The number of points on the antlers of a deer is not a reliable indication of the animal's age.

The Part Science Plays In Conservation

(Editor's Note—The following article is from an address delivered August 7th, by James Nelson Gowanloch, Chief Biologist of the Division of Wildlife and Fisheries, before the Rotary Club of Jennings.)

By

James Nelson Gowanloch,
Chief Biologist

The place of science in the world is threefold: First, to understand events; second, to predict events; and, third, if possible, to control events. Science thus in conservation as elsewhere becomes our invaluable servant.

It is perfectly clear that in the few minutes here available only a few highlights of science and conservation can be related. Let us therefore speak of just five things: Crabs, oysters, muskrats, shrimp, and the Mississippi River. The most important of these by a great deal is the Mississippi River.

Just as it becomes so often impossible to see the forest for the trees, so, too, we in Louisiana altogether too often forget how vastly important is our State among the states of the Union for its natural resources. Also we forget how truly the wealth of certain of these natural resources rests directly and squarely on the fact that through a long unknown period of centuries the Mississippi River has poured its waters through our State into the warm salt waters of the Gulf of Mexico. We have produced in a single year in the coastal waters of Louisiana seventy percent of all of the shrimp produced in the United States and Alaska. We have produced in a single year in only the coastal one-eighth of the State of Louisiana one-half of all the muskrat pelts produced in the whole of the United States.

What have these facts to do with the Mississippi River? The answer is: "The Mississippi River is the cause, these facts are the effect."

The Mississippi River drains all or part of thirty-one states and two Canadian provinces, a total of one and one-fourth million square miles, an area equalling approximately one-half of the total land surface of the United States of America. The Mississippi River annually carries into the Gulf of Mexico an estimated three hundred and fifty million tons of silt (suspended solids) and an additional estimated one hun-

dred and forty million tons of dissolved substances, a total of four hundred and ninety million tons of material, much of it essential for the enrichment of our coastal lands and the formation of new coastal Louisiana earth.

Complicated and fundamentally important are the events that occur as the waters of this vast river rush into the Gulf of Mexico. The velocity of the current diminishes. A load of silt is deposited. The fresh water with its dissolved substances reacts with the chemicals (electrolytes) of the sea water so that certain dissolved substances are likewise deposited. Natural levees, barriers, and open bays, all newly made Louisiana earth, are formed. Our constantly changing coastline, our innumerable bays and our patterned bayous, enriched by these contributions, afford haven and nursery ground for many valuable living natural resources.

I thought that perhaps it might interest you if I touched upon merely a few aspects of four of these natural resources, crabs, oysters, muskrats and shrimp, in the order already given. All four of these animals depend, for their productivity directly upon the fluctuating balance of salt and fresh water and the rich stores of essential material contributed by the Mississippi River and our other seaward-bound Louisiana streams. There flows westward along our coast a current, compensating for an eastward-flowing farther offshore current. This westward current sweeps, to as far as the Texas border and beyond, the riches that the river has brought.

Our common crab, the blue crab, or to give it its seventeen dollar and fifty cent name, *Callinectes sapidus*, is an animal of very wide distribution. I have found it as far north as northern Nova Scotia. The life history of the crab is peculiar. A single female carries an average of one and three quarter million eggs in the so-called sponge, but may have as high as three million eggs.

The blue crab usually comes into brackish water to mate and then migrates seaward. These crab eggs, after about fourteen days, hatch into strange little creatures called zoeae, grotesque in appearance, big-eyed and measuring only thirty-three one thousandths of an inch in length. Complicated changes follow, before each of which this tiny crab molts. It finally assumes the form

of the adult and is in fact a miniature of its parents. Please note that a miniature it really is for it then measures only one-eighth of an inch across. Speed of growth is determined by temperature and food, and throughout its development its growth must always follow shedding since unlike ourselves the crab carries its skeleton not on its inside but on its outside.

The whole process of securing soft-shelled crabs is one of choosing the right moment when the crab is shedding naturally. There are ways of telling when a crab will soon shed, but there is no way known whereby crabs can be made to shed artificially.

Crabs have been known to ascend into fresh water as far as one hundred and sixty miles up the Atchafalaya at Simmesport. Our State offers marvelous crab resources since the conditions for the various stages of the crab's life are realized in the varying water conditions over wide areas along the Louisiana coast.

Oysters have a life equally peculiar. Probably not one person in a hundred thousand who enjoy oysters has ever seen a really young oyster. Transparent as glass, it requires the use of high-powered compound microscopes for examination. Oyster eggs are so small that five hundred laid side by side make up only one inch. A single large female oyster can lay as many as sixty million eggs in one year. The oyster eggs hatch into small glasslike organisms that swim feebly, drift about with the current, form a tiny shell and at the end of fourteen days are ready to settle down and become oyster "spat."

Now the extraordinary thing is that before they can settle down they require the presence in the water of a minute quantity of dissolved copper. If this copper is not available they perish. If it is available they attach to the clean surface of shells or other objects and become little oysters, but little indeed since they are now only one-seventy-fifth of an inch across. As many as two thousand can become attached to the inner surface of one oyster shell. So minute is the quantity of copper needed that it is almost unbelievable. Let me state it this way: If I place in each of two glass bowls of copper-free sea water a group of similar fourteen-day-old swimming oyster larvae, and if I hold in one of these bowls a

Lincoln penny for only thirty seconds and then remove it, enough copper will pass into the water in that half minute to enable the oyster larvae to get the copper they need. These oysters will attach and live. The oysters in the other bowl will die. The Mississippi River brings to our oyster areas the copper that they need.

You may wonder why I have discussed these early stages which are so exceedingly small that very probably no one here has ever seen them. The point that I wish to make clear is simply this, that those unrealized, unseen, early developmental chapters in the life history of such animals as the crab, oyster and shrimp are just as important and often more important in the production of successful commercial crops of these food animals as are the later adult familiar forms. Often, indeed, these larval chapters in development are greatly more sensitive to and more easily damaged by influences of weather, water chemistry and other factors than are these same animals at any other time.

Louisiana is also peculiarly favored for oyster production for four reasons: First, we have vast areas of suitable oyster bottom; second, oysters grow the year around; third, we have a marvelous set of oyster spat; and, fourth, the starfish that on the New England coasts cause hundreds of thousands of dollars damage to oysters every year cannot live in the silted inshore waters of the Gulf.

Recent work by the Oyster Division of the Department of Conservation has brought into our State a new and highly efficient technique for the planting of oyster shells and the production of a greater oyster crop.

Muskrats provide a great industry for Louisiana. It is almost unbelievable that in only one-eighth of the total area of our State we produce almost exactly one-half (49.4%) of the total muskrat pelts of our whole country. Yet this is true. The reason again is the Mississippi River. Muskrats feed chiefly on three-cornered grass, a type of bulrush of the sedge family, known technically as *Sagittaria*. Various species occur in Louisiana, some living in both fresh and brackish, others only in fresh water. The land built up by the ever active Mississippi River is extremely favorable

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Forest Grazing Studies Now Under Way in Louisiana

By W. R. Chapline, Chief, Division of Range Research Forest Service, U. S. Department of Agriculture, Washington, D. C.

Congress recently provided the Forest Service with an appropriation of \$12,500 to initiate a study of forest grazing in Louisiana. The work will be centered at the Southern Forest Experiment Station with headquarters in New Orleans under Director E. L. Demmon.

Production of meat, hides, and wool can be increased considerably in Louisiana by better grazing use of its 16 million acres of forest lands, and by coordination of this grazing with improved farm pastures and harvested feeds. Even with the nation's livestock production at an all time peak, demand for meat and hides, critical war products, far exceeds the supply. The Army is taking increasing amounts of beef. With reduced marketings of live animals reaching federal inspected slaughter, our metropolitan centers are suffering an even greater shortage than in 1942, with intensified demand from wartime workers. Live weight production of cattle, calves, hogs, sheep and lambs in 1942 reached 41.3 billion pounds. In terms of meat production for consumption, there was a total of nearly 22 billion pounds, of which beef and veal made up over 9.8 billion. Still greater amounts will be needed this year, during the war, and in the immediate post war period.

The 950 million acres of native forage producing lands in this country play a vital part in meat, hide and wool production. It would appear that such lands, especially cut-over forest lands in the South, can be utilized to much better advantage for livestock production than they now are. Louisiana and the whole South now imports considerable amounts of beef. Moreover, the rural population would be benefited by an increase in beef consumption.

Cattle and calf production in Louisiana, in 1942, according to the U. S. Bureau of Agricultural Economics estimates, totalled 166 million pounds, live weight, from 1,216,000 head of stock on hand January 1, 1942. The average calf crop, in 1942, was 68 percent. Sales value averaged \$8.40 a hundred pounds for cattle and \$10.60 a hundred pounds for calves, and yielded a gross income of 13.8 million dollars. An economic study made recently at the Louisiana State Agricultural Experiment

Station, showed that of 197 farms studied, the calf crop percentage for the year September 1939 to August 1940, ranged from a low of 47 percent to a high of 74 percent. Mortality varied from 2 to 14 percent. Such a situation offers an opportunity and a challenge for increased beef production.

Forest Range Situation in Louisiana

In Louisiana, out of 29 million acres, 16 million are in forests. About half is in bottomland hardwoods and on the balance pine predominates. Much of this area is now grazed as open range. Development of better grazing practices for this great forest area would help provide additional meat and hides urgently needed for the armed forces during the war and

(Editor's Note:—Louisiana has recently been provided with \$12,500 by Congress to make a study of forest grazing in the State. In this article by W. R. Chapline, Chief of the Division of Range Research of the United States Forest Service, details of the work to be undertaken are outlined.)

would make it possible for farm people to eat and live better both during and after the war. Better use of forest lands for grazing can go right along with the growing of timber, pulpwood, and other important forest products.

Most of this forest land has been cut over and is restocking to trees in varying degrees. Some areas are satisfactorily reproducing; others have been planted; still others have but few trees on them now and might well be planted later on. The great bulk of the cut-over land is producing grass and other vegetation suitable for grazing.

Nearly all the forest area is grazed to some degree now. Too often animals are just turned loose in the woods throughout the year and suffer from a shortage of good forage during the fall and winter. During the spring and summer, cattle fatten, but as the grasses become tough, cattle lose weight rapidly. The result is inadequate livestock production.

Many efforts have been made to develop cut-over forest lands into improved pastures. In the bottomlands where soils are satisfactory, this has proven profitable; but

where soils are rather poor, it has not proved too successful.

The use of forest lands for grazing, it would seem, should be mainly to obtain maximum value from the native forage consistent with continued timber and other forest production. On such forests grazing can furnish a cash income while young timber is growing and can also help reduce fire hazard by reducing the grass cover which carries fire rapidly.

A primary problem is to find out what is the best season to graze the woods. Another is to determine the most effective coordination between forest grazing and farm feeds, including improved pastures and the use of supplements and field residues. Keeping the animals in better condition throughout the year would in turn produce more calves, more meat and further animal production.

In the Coastal Plain of Georgia and North Carolina the forest grazing problem has been under study for about 2 or 3 years by the Forest Service, in cooperation with the State Agricultural Experiment Stations of those states and the U. S. Bureaus of Animal and Plant Industry. These studies have shown that much greater cattle production can be obtained on forest lands in that part of the Southeast. By grazing cattle on the forest range only during the spring and summer seasons, when the native forest plants are succulent and of high nutrient value and by combining the forest grazing with improved pastures, crop residues and other supplemental feeds on farm lands, the cattle have kept in good condition throughout the year. Under other conditions in those states and with supplemental feeding of cottonseed cake in fall and early winter, cattle can be grazed 8 to 10 months of the year on cutover forest land.

Through application of such practices it has been possible to graze more cattle, produce more calves and reduce death losses. Moreover, the calves grow better, furnish more meat and are of better quality. Calves from cows grazed about 10 months on native reeds growing on cut-over forest land in North Carolina have weighed 400 pounds at weaning time, far greater weights than the average of calves produced on comparable forest lands in the Coastal Plain of North Carolina in past years.

By supplementing an experimental forest range herd of cows

in Southern Georgia from October 15, 1942 to January 22, 1943, with 2 pounds of cottonseed cake per head per day resulted in an average gain of 22 pounds per cow in contrast to an average loss of 8 pounds for unsupplemented cows during this 100 day period. The 103 pound difference was attained at a cost of \$4 per head. The experimental herd in South Georgia has a calf crop of 91 percent this year, in contrast to an average of about 40 percent on forest range in that area grazed year long.

Grazing has also served as a aid in forest fire protection. In the Coastal Plain of North Carolina, most of the stockmen do not want to burn their ranges. The increased values of their cattle and the adjusting of their seasons to a period when the feed has its greatest value has changed the attitude about forest fire protection in that area. On the other hand in South Georgia, controlled burning every 2 or 3 years seems advisable on the basis of preliminary results, in order to avoid devastating fires and to make available more green forage. Forest fires have been so devastating in the past in relation to timber and naval stores production that it is impossible to generalize for the South as a whole. It is easily possible that either one of these two results or something entirely different might be most suitable under Louisiana conditions.

Parasites are an important hazard to livestock production in the South, but material progress has been made in their control by state and federal governments.

The Louisiana Agricultural Experiment Station has worked closely with the Bureaus of Animal, Dairy and Plant Industries of the federal government. Their studies have shown that animals better adapted to the warm, humid conditions generally prevailing in the South can be developed. These studies have also shown how to improve pastures on good farm land soils and how to raise suitable forage crops for supplementing forest grazing. The new studies of forest grazing will supplement, but will not duplicate these animal and pasture studies.

The Louisiana State Agricultural Experiment Station is vitally interested in the new work which will be developed in close cooperation with that Station. The approach planned on the problem of forest grazing will be first to determine through an extensive survey what practices are now fol

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SCIENCE AND CONSERVATION

(Continued from Page 5)

muskrat production in the coastal zones of the State. The Division of Wildlife and Fisheries of the Department of Conservation is carrying out a careful scientific program that already has revealed new facts which, applied practically, have resulted in a working out of better methods of muskrat marsh management. These methods, will mean in the future, increased millions of dollars in revenues for the owners and operators of muskrat land. Control of water level, adequate mowing (to prevent the muskrats from eating out the marsh), and the proper use of burning techniques on muskrat land, are among the basic essential procedures. When the Commissioner of Conservation of the State of Alabama asked me the way in which he could make Alabama more productive of muskrats as is the State of Louisiana, I was compelled to answer that he had omitted one important part of his program. He had not arranged to have the Mississippi River flow through his state for the last few hundred years.

A word about shrimp and I am through. The shrimp industry of Louisiana is one of the great fisheries of the whole continent and, indeed, of the whole world. It is ranked as high as fifth in volume and fifth in value in all the fisheries of the United States and Alaska, and yet, before the shrimp investigations of its life history were begun through the cooperative scientific studies of the Department of Conservation of Louisiana and the Federal Government, less was known about our sea shrimp than about any other important seafood animal. Three shrimp make up our sea shrimp species, the sea-bob, *Litopenaeus setiferus*, the Brazilian or grooved shrimp, *Penaeus aztecus*, and the lake shrimp or white shrimp, *Penaeus setiferus*. The lake shrimp, so-called because New Orleans was early supplied by shrimp caught in Lake Pontchartrain, has made up over ninety-five per cent of our total shrimp harvest and is therefore by far the most important. Its life history is strange, its production enormous. In a single year Louisiana has produced as much as one hundred and eight million pounds of shrimp, constituting sixty-five per cent of the total shrimp of all the United States and Alaska. We have studied

shrimp by exact, painstaking and very tedious methods and have discovered the main facts of their life history, knowledge that is necessary for the proper exploitation of this resource.

Lake shrimp are essentially sea animals. They mate fifty miles offshore, the male transferring to the female two small gelatinous capsules of sperm. When the female lays her eggs which may number three hundred thousand she does not attach them to her body, as do the crab and crawfish, but casts them adrift in the sea. They float as tiny glass-like objects, each only one hundredth of one inch in diameter, until after about fifteen hours they hatch into minute creatures one-eighth of an inch long, utterly unlike shrimp in appearance. These helpless specks of living matter undergo a series of peculiar changes, molting from one stage into the next until no less than thirteen extraordinary transformations have been accomplished. Then, when they are still only one-eighth of an inch in length they assume roughly the general appearance of their parents and descend to the bottom. These minute shrimp find their nursery grounds in the inshore waters of the State, far away from their birthplace in the open ocean. They then undergo rapid growth, increasing their length as much as one and two-fifth inches in a single month. They perform various migratory movements and come back into our commercial fishery when they are less than a year old. Lake shrimp spawned offshore in late March may reach the inshore waters by early April and may become by early August shrimp averaging three and one-half inches long by August first. We have studied the movements of shrimp by tagging them and we have had recoveries of such tagged individuals of as high as twenty-eight per cent of the total tagged group. Some of these tagged individuals have been recovered as far away as four hundred and fifty miles from the point where they were released. Consider the hazards of fish and birds that such a shrimp must face while traveling such distances.

Shrimp apparently live only for one year.

Our shrimp fishery seems in no present danger of depletion. We have a great deal of evidence of this from various carefully evaluated research. This brief reference to the shrimp I must conclude by stating again that like the other resources named this

vast production of valuable seafood is a direct result of the stores of essential materials poured into our shrinking grounds by the Father of Waters.

The war with its almost inconceivable problems of combat front, assembly line, agricultural production, and the production of sea resources brings more sharply than ever to our service the essential knowledge that science provides.

If "the fish that got away" could hear itself described, no doubt it would feel like a whale.

OIL COMPACT COMMISSION TO MEET IN SANTA FE, NEW MEXICO

The quarterly meeting of the Interstate Oil Compact Commission, composed of representatives from the oil producing States of the nation, will be held beginning September 24th at Santa Fe, New Mexico. Conservation Commissioner Joseph L. McHugh will attend the meeting as a representative from Louisiana and from there will go to Washington to attend a conference with Petroleum Administrator Harold Ickes.

FISHING REGULATIONS FOR 1943 IN ALL PUBLIC WATERS

SPECIES	SIZE LIMIT (in inches)	CREEL LIMIT (Fish per day)
†Trout ("Speckled")	Under 12	25
†Redfish	Under 16	25
†Sheepshead	Under 10	25
Flounders	No Limit	25
*Black Bass ("Green Trout")	10	20
*Yellow Bass ("Striped Bass")	7	20
*White Bass ("Bar Fish")	7	25
*Crappie ("White Perch", "Speckled Perch", "Sac-a-lait")	7	25
*Sunfish ("Perch", "Bream", "Goggle-eye", etc.)	No Limit	100
Catfish	14	25
Buffalofish	16	25
Gaspergou	No Limit	No Limit
Paddlefish ("Spoon-bill Cat")	15 pounds	No Limit
Common Bullfrogs	5 ½	No Limit
Southern Bullfrogs	3 ½	No Limit
Carp	No Limit	No Limit
Hard-Shell Crabs	6	No Limit
Soft-Shell Crabs	4 ½	No Limit
Diamond-back Terrapin	6	No Limit
**Salt Water Shrimp (except Sea Bobs)	See note below this table	

*These are fresh water fish and their sale is prohibited.

**Must be not smaller than 68 shrimp to the pound.

†Trout, Redfish and Sheepshead larger than these sizes may be taken without limit.

Size limit expressed in table is minimum except Trout, Redfish and Sheepshead.

There is no state-wide closed season on game or commercial fish. The Department of Conservation may authorize closed seasons or closed zones in ANY water where necessary but unless this has been done fish may be taken at any time or place provided size limits and other restrictions are observed.

License must be kept in possession when fishing and shown on demand to any authorized agent or officer.

Penalties for violating fish laws: First violation, 25 to \$100 or imprisonment ten days to 60 days, or both. Second or later offense, \$100 to \$300, or imprisonment 30 days to 90 days, or both. Even more stringent penalties are provided for violation of the shrimp law.



TYPES OF VIOLATIONS WHICH OCCURRED DURING AUGUST

Angling Without License.....	4
Possessing Undersize Game Fish	10
Using Illegal Tackle to Catch Game Fish	31
Selling Game Fish	2
Commercial Fishing Without License	2
Possessing Undersize Commercial Fish	2
Commercial Fishing Illegal Tackle	2
Catching and Possessing Shrimp in Closed Season.....	6
Hunting on State Preserves.....	9
Hunting and Killing Doe Deer	2
Hunting Rabbits Out of Season	3
Hunting Squirrels Out of Season	12
Total.....	85

PARISHES IN WHICH VIOLATIONS OCCURRED AND ARRESTS MADE IN AUGUST

Caddo	2
Caldwell	3
Catahoula	4
Concordia	3
De Soto	2
East Baton Rouge	1
Evangeline	2
Franklin	1
Grant	5
Jefferson	5
Lincoln	1
Livingston	3
Madison	8
Natchitoches	7
Ouachita	3
Pointe Coupee	2
Rapides	8
Richland	1
St. Charles	1
St. Tammany	3
Tensas	3
Union	16
Webster	1
Total.....	85

AGENTS PARTICIPATING IN AUGUST ARRESTS

J. W. Bates, Angelo Benandi, Levert H. Bird, John Busalacchi, A. B. Burns, Ernest Coats, Fred

Cook, Mark B. Cooper, Jackson L. Dorsey, Tom C. Duck, Marvin J. Fallin, D. L. Farrar, T. H. Forman, Jr., Fremont Fuselier, John W. Gilbert, E. B. Head, Lesma Herbert, John T. Hollis, Robert D. Landry, Buckner P. LeBlanc, Jos. C. LeBlanc, W. J. McCauley, Jas. E. McFerrin, J. V. McConnell, Ben Mayeux, T. E. Minton, Earl H. Nugent, Chas. J. Olano, P. S. Reardon, Edgar (Jack) Stanfield, T. W. Stewart, Allen D. Swayze, Oliver Taunton, Frank Trocchianno, Hector Waguespack, L. C. Weaver, Elton Williams.

EIGHT MINERAL HEARINGS HELD SEPT. 15-16

A total of eight mineral hearings were held Wednesday and Thursday, September 15th and 16th, in New Orleans by the Minerals Division of the Conservation Department.

Five hearings were held on Wednesday and three were held on Thursday. All of the cases were taken under advisement by the Conservation Commissioner and his technical staff.

FOREST GRAZING STUDIES IN LOUISIANA

(Continued from Page 6)

lowed by farmers and stockmen in their use of forest lands for grazing. Such a survey will indicate what practices are making for success and which are causing difficulties. It will also open up questions which are troubling users of forest land and point out those problems which seem to offer the best opportunity for study to develop the most effective and quickest results in the form of improved grazing practices.

The eggs of the ruddy duck weigh three times the weight of the bird. Hen ruddies weigh one pound, her clutch of fourteen eggs weighs three pounds.

Hummingbirds can fly backward as well as forward. The backward flight is commonly used as the bird darts to and from flowers and bushes, on which it feeds.



SUPPRESS THE DEMON— FIRE!

(From the Farmville Gazette)

We are, usually, too negligent about looking about us, right before us, things right at our feet and under our very eyes; things which, sometimes, are a curse to the public interest.

One of these things is the destruction wrought by fires in our woodlands. Forest fires, as they are termed by the state, are extremely destructive. Their cost annually runs up into multiplied millions of dollars. And right here in our own Union parish the cost has been and is enormous, rightly figured.

Elsewhere in this paper appears an article referring to Officer G. M. Edwards, State Investigator for the Department of Conservation, who calls attention to the efforts of the department and its collaborators in preventing and suppressing these fires. It is hoped the people generally will take notice and govern themselves accordingly. It is patriotic at present to do so.

It is useless to undertake to enumerate here the damage of burning the woods. All intelligent citizens are already aware of it. A few reminders, however, might serve to quicken the minds of the people to the importance of preventing and suppressing forest fires.

These fires, sweeping across the woods during dry weather such as has prevailed here during the past several weeks and which usually prevails at this season of the year, destroy everything before them. Young pine trees which, a quarter of a century from now, will be saw logs, are utterly destroyed. Other vegetation also is destroyed and the whole area left scorched earth. This means valuable property of future years gone. This property would have benefitted a succeeding generation. Those living now owe something to the generations to follow, and it is incumbent on them to guard, protect and preserve resources, such as our growing woodlands, for those who are to follow us will bless us if we do this.

Fire destroys not only young timber, but also the decaying

vegetation on the land which, in time, deepens the soil bed and adds to the fertility and value of the soil. All know that everything that rots on the land adds to the fertility of that land. And there are many other damages left by fire, too numerous to mention. Let everybody heed Mr. Edwards' plea and cooperate with him and the department in preventing and suppressing fires in the woods. Our children and our children's children will reap the benefit after years and bless us for our wisdom and forethought.

LIME FOR THE LAND

(From the Ruston Leader)

We believe with the opening of the lime kiln yesterday North Louisiana history can be changed. Our loose soil has been washed down the red sides of clay hills until its productive service is usually anywhere from one fourth of an inch to six inches deep. It will not hold fertilizer because of its sandy nature which allows all fertility to seep through and the steepest hills rush it on its way to the river bottoms. However lime will change all this. We can now put some base into the earth from which better crops will grow and the profit per acre will be increased.

The present state administration can count this lime kiln among its manifold achievements because much effort has been put into the work of getting it into production. Already farmers of this parish and the demonstration farm at the college has received lime from other quarries to spread on their fields and prove to others the worth of its use. We understand a price has been set so low that lime can be obtained by the smallest man and the quantity of the deposit is so great will be there for many, many years.

Our economy rests on the back of the farmer and when he raises his standard of living ours goes up with him. This is a great opportunity which we trust will be grasped and used to the fullest. The lime will do no good in the ground, but mixed with good honest sweat it will change the future of Lincoln Parish, restore the college which teaches boys and girls from the hills and will enable us to become even more proud of our community than we have ever been before.

Careful estimates show that 120,000,000 acres of former waste land habitat have been taken from use by agriculture, manufacturing, and other industries.